



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/788,979      | 02/27/2004  | Wolfgang Aderhold    | 008304              | 6862             |

60300 7590 04/11/2012  
LAW OFFICES OF CHARLES GUENZER  
ATTN: APPLIED MATERIALS, INC.  
2211 PARK BOULEVARD  
P.O. BOX 60729  
PALO ALTO, CA 94306

|          |
|----------|
| EXAMINER |
|----------|

PAIK, SANG YEOP

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

3742

|           |               |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

04/11/2012

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

---

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/788,979  
Filing Date: February 27, 2004  
Appellant(s): ADERHOLD ET AL.

---

Charles S. Guenzer  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 1/26/2012 appealing from the Office action mailed 9/16/2011.

**(1) Real Party in Interest**

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

Board decision has been previously rendered in this application on June 28, 2010 in Appeal 2009-003417.

**(3) Status of Claims**

The following is a list of claims that are rejected and pending in the application:

Claims 1-5, 7, 8, 13-15, and 30-32 are appealed which stand finally rejected.

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being

Art Unit: 3742

maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

### **(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

### **(8) Evidence Relied Upon**

|           |                |        |
|-----------|----------------|--------|
| 5,601,366 | Paranjpe       | 2-1997 |
| 4,891,499 | Moslehi        | 1-1990 |
| 6,090,210 | Balance et al  | 7-2000 |
| 6,113,703 | Anderson et al | 9-2000 |

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Paranjpe (US 5,601,366).

Paranjpe shows the method claimed including a radiant source (50), a substrate/wafer (29) that is disposed with a front side facing downwardly, and pyrometrically monitoring the radiation emitted from the front side of the substrate wherein the radial positions are monitored. Also see Figure 2, and column 5, lines 29-59).

Claims 3-5, 7, 8, 13-15 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paranjpe (US 5,601,366) in view of Moslehi (US 4,891,499), Ballance et al (US 6,090,210) or Anderson et al (US 6,113,703).

Paranjpe shows the method and the apparatus claimed including a radiant source (50), a substrate/wafer (29) that is disposed with a front side facing downwardly, and pyrometrically monitoring the radiation emitted from the front side of the substrate wherein the radial positions are monitored. But, Paranjpe does not show a peripheral fixture including an annular shelf.

Moslehi '499 shows a reactor chamber (12) having a radiant heat source (24) for thermal processing of a substrate/wafer (28) with its front side/device side (28) face down the reaction chamber wherein the substrate is supported by an annular ring/shelf (46) contacting the substrate via pins (56) which further shows having a slope for supporting and extending under the substrate around its center wherein the ring with the pins extends or overlaps no further than an edge of the front side of the substrate (also see Figures 2 and 3, and column 6, lines 57-61). Ballance also shows a thermal processing apparatus with a radiant source, an annular ring (18) for contacting and holding a substrate wafer with an edge which extends or overlaps an edge of the substrate, a chamber (12) for holding the substrate therein, and Ballance further shows a reflector (28) parallel to the substrate and a pyrometer (34) for measuring temperatures at a plurality of radial positions relative to the center of the substrate. Anderson also shows that it is well known in the art to provide a sloping annular ring

Art Unit: 3742

(16) for contacting and supporting a wafer thereon for the wafer that is processed in a thermal processing apparatus.

In view of Molehi '499, Ballance or Anderson, it would have been obvious to one of ordinary skill in the art to adapt Paranjpe with an annular ring for contacting and supporting the substrate that is well known in the art, and it would also have been obvious to adapt Paranjpe with a reflector in the reactor (12) to allow more even heat distribution in the chamber for thermally processing and heating the substrate disposed therein.

With respect to claim 4, while the recited edge exclusion zone of no more than 3 mm is explicitly shown, it would have been obvious to one of ordinary skill in the art to adapt Paranjpe limit such zone within the recited range or any other suitable range as a matter of a routine experimentation to provide the supporting holding means with only a minimum extension that would adequately and sufficiently support the substrate without much overlapping or blocking the thermal processing of the working surface of the substrate.

#### **(10) Response to Argument**

The appellant argues that while Paranjpe in col. 5, lines 52-54, states for "the pyrometer [that] can be used to image the radiation from either side surface of the wafer, higher accuracy can be obtained for the unpatterned backside," Paranjpe does not teach for the combination of back side pyrometric monitoring and topside radiation of an inverted wafer. The appellant further argues that Paranjpe teaches against from

Art Unit: 3742

having a front side pyrometric monitoring of the wafer. This argument is not deemed persuasive since Paranjpe clearly shows for pyrometric monitoring of either side of the wafer in its invention wherein Paranjpe clearly shows of the wafer processing and heating are performed face-down and from the back side (column 5, lines 23-27). This disclosure clearly shows of the pyrometric monitoring of the front side of the wafer as the wafer is shown processed with its face down arrangement. It is noted that there is no other contrary showing that Paranjpe limits its invention only of the pyrometric monitoring of the back side of the inverted wafer as argued by the appellant.

With respect to Moslehi '499, the appellant argues that Moslehi '499 does not teach for the pyrometric monitoring of the unpatterned back side of the wafer or the supporting annular ledge. This argument is not deemed persuasive since Moslehi '499 shows an annular ring (46) with pins (56) that supports the inverted wafer having its patterned front side facing down wherein the back side of the wafer is thermally processed as that of in Paranjpe. Also, as Ballance or Anderson is further applied to show a sloping annular ring for supporting a wafer, the combination of Moslehi '499 and Ballance or Anderson shows the recited annular shelf wherein the recited edge exclusion zone would have been obvious to one of ordinary skill in the art as an obvious experimentation to limit the edge extension that would adequately and sufficiently support the substrate without much overlapping or blocking the thermal processing of the working surface of the substrate.

The appellant argues Ballance teaches for the back side pyrometry on a front side-up wafer and Moslehi teaches for back side pyrometry on a front side down wafer,

Art Unit: 3742

and therefore one of ordinary skill would conclude that back side pyrometry is the only preference in the art that is also reinforced by Paranjpe. This argument is not deemed persuasive since as Paranjpe allows for the pyrometric monitoring of either side for the inverted wafer with its side facing down, one of ordinary skill in the art to would also predictably conclude that the pyrometric monitoring of the front side face down wafer can be performed. Furthermore, as Anderson shows providing pyrometers on both sides of the wafer, one of ordinary skill in the art would not limit the use of pyrometers only for the backside of the wafer, whether the wafer is front side facing down or not. As indicate by Paranjpe that although higher accuracy can be obtained from monitoring the back side of the wafer, Paranjpe shows it is known to monitor either side of the inverted wafer having its front side facing down which would then enable one of ordinary skill in the art to make predictable modifications in the thermal processing system of Paranjpe including the recited reflector as taught by the applied art to provide for more evenly distributed heat in a heating chamber within which the wafer is provided thereto.

Thus, the appellant's arguments are not deemed persuasive.



Art Unit: 3742

**(11) Related Proceeding(s) Appendix**

Copies of the court or Board decision(s) identified in the Related Appeals and Interferences section of this examiner's answer are provided herein.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/SANG Y PAIK/

Primary Examiner, Art Unit 3742

Conferees:

/HENRY YUEN/

Supervisory Patent Examiner, Art Unit 3742

/TU B HOANG/

Supervisory Patent Examiner, Art Unit 3742